APR 5 1935

STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

VOLUME 16 MARCH · 1935 NUMBER 3

America's Standing Army for Health Defense

OVER a million and a half people in this country, according to a rough estimate, are engaged directly or indirectly in caring for the sick and preventing disease. This gigantic army has many subdivisions. It includes the highly skilled group of physicians and surgeons together with dentists, nurses, osteopaths, chiropractors, naturopaths and healers of various kinds. To these are added pharmacists, drug clerks, laboratory and clerical assistants, hospitals workers and superintendents, and medical social workers, a recently annexed group who have already made a definite contribution to the healing art. Let us now analyze this conglomerate standing army a little more carefully.

At the head of the list stand the 161,000 legally qualified physicians and surgeons. The number of doctors per unit of population has been declining, although the United States still has the highest per capita proportion of any country in the world. In 1930 there were 125 physicians to every 100,000 inhabitants of the country; in 1920 there were 137; in 1910, 164; and in 1900, 173. This decline undoubtedly represents a rise in the qualifications that are being demanded before a license to practice medicine is granted. This is clearly indicated by the recent history of our medical schools and of the national and state boards of medical licenture.

The statistics seem to indicate that the number of physicians in the country is adequate. The difficulty lies in their unequal distribution; many places, especially the large urban centers, are probably overmanned, while many rural areas suffer from an under-supply of physicians. The question is too involved, however, to permit a clear-cut answer as to whether there is or is not a shortage of doctors. The demand for medical service rises or falls with changes in the state of the public health; it depends also upon the organization of medical practice and other factors such, for example, as the improvement in methods of transportation which enables the physician to serve a larger district than was formerly possible. One interesting phase of the problem of medical care is the direct relation between the per capita income in different sections of the country and the concentration of physicians. As

income increases so, too, does the ratio of physicians. In the South,* with the lowest per capita income in 1929, there was the smallest number of physicians per 100,000 population, namely, 100 per 100,000 in the East South Central States, 107 in the West South Central States, and 111 in the South Atlantic States. On the other hand, the Pacific Coast, New England and Middle Atlantic States, with the greatest concentration of income had the largest ratios of doctors, that is, 159 per 100,000 in the Pacific Coast States, 140 in New England and 138 in the Middle Atlantic States.

It has been estimated that these practitioners of medicine are assisted by about 24,000 attendants, exclusive of trained nurses. These latter numbered 294,000 in 1930. The ratio of nurses to population has grown very rapidly, having risen from 16 per 100,000 in 1900, to 90 in 1910, 141 in 1920, and 240 in 1930—an increase of approximately 1,400 percent in 30 years. Of the graduate nurses, 55 percent were engaged in private duty in 1930; 9 percent were in public health work and industrial medical service; and 36 percent were serving in institutions such as hospitals and clinics. Nurses, like physicians, tend to settle in the larger communities where wealth is greatest and hospitals most numerous. The rural areas that lack local hospitals suffer particularly from a shortage of trained nurses, but this lack is being partly met by the recent development of rural health work with its great reliance on trained public health nursing personnel.

The 1930 Census also indicated that about 150,000 women act as practical nurses, assisting in the medical care of patients and performing various household duties in the home. These attendants are of all degrees of skill; but on the whole they meet a very real need in times of sickness. Likewise serving the physicians directly are 500 physiotherapists and 1,400 clinical laboratory workers. We might also include in this class 3,000 masseurs, some of whom work under doctor's orders, while others do not. In all the above categories and in the discussion that follows, we must admit that our statistics are not nearly as definite as we would like to have them and that some errors have undoubtedly crept in. Nevertheless, the estimates are as accurate as the COMMITTEE ON THE COSTS OF MEDICAL CARE were able to make them after several years of research.

Dentistry is a form of medical service which has shown very real progress since the beginning of the century. In 1900 there were about 30,000 dentists in the United States, or 39 to every 100,000 in the population; in 1910, 43; in 1920, 53; and in 1930, there were over 70,000 dentists or 58 to every 100,000 people. The number of dentists' assistants and attendants has increased even faster—from two per 100,000 in 1910 (the first Census report in which this occupational group was listed) to 11 in 1930. This is equivalent to 14,000

*i.e. the South Atlantic, East South Central and West South Central States.

workers. The COMMITTEE ON THE COSTS OF MEDICAL CARE has made an even higher estimate of the number who aid the dentist in caring for the teeth and mouth. First among these are over 2,000 oral hygienists, forming a practically new profession, whose work is preventive rather than curative. There are also about 10,000 dental technicians, and 10,000 other dental assistants of various kinds. This growth in dental personnel reflects the changed attitude toward oral disease and hygiene. The relationship between dentistry and general health is becoming more and more clearly recognized; and as the people of the country realize the importance of preventing dental decay, the number of skilled operators to furnish dental services will still further increase. At the present time, dentistry is still considered a luxury by families of low economic level which they are forced to forego, except for emergency treatments.

Having disposed of the physicians, nurses, dentists and their assistants, we have a large residue of people often without very adequate training in medical science who are providing a variety of health services. According to the 1930 Census there are about 36,000 other practitioners (or one fourth the number of qualified physicians) classified as osteopaths, chiropractors and "healers". Many of the osteopaths are also licensed to practice medicine, and many others have had a rather thorough medical training, having graduated from a four years' course in a college of osteopathy. These colleges, however, do not, in general, measure up to the high requirements now set by the medical schools of the country, although some of their graduates have been able to pass creditably the State Board licensing examinations. On the other hand, the activities of chiropractors and healers are restricted by law to certain specific procedures. This is also true of what may be termed "secondary practitioners", such as 47,000 midwives, 5,000 chiropodists, and 20,000 optometrists who perform only certain specified services. Until comparatively recently, the midwife was left to her own devices; but many attempts are being made to improve her education and training and to supervise her work, which in the future must take on greater importance. The other two groups are also striving to raise the standards of their work.

Finally, we must include the hospital superintendents and personnel (553,000), the other clinical attendants (5,000) the health department workers (11,500) and several thousands in private health organizations—altogether somewhat over 570,000 people. There were also in 1931, almost 125,000 registered pharmacists, 17,000 assistant pharmacists and 60,000 apprentice pharmacists who were gaining practical experience under the supervision of registered pharmacists while learning the drug business—in round numbers 200,000 people engaged in compounding and dispensing medicines. With the exception of one small, but increasingly important

group, the 2,500 medical social workers, this completes our enumeration of the personnel engaged in providing health services for the people of the United States. It is, all in all, a most impressive showing!

The Final Drive in the Campaign Against Tuberculosis

Now is the time for the medical profession, the public health organizations, the social agencies and the general public, to unite in a drive to reduce tuberculosis to the position of a minor cause of death. The war against this disease has been so amazingly successful that there is no excuse for a let-down in our efforts to conquer tuberculosis.

The STATISTICAL BULLETIN has recorded from time to time the chief gains made in the anti-tuberculosis campaign. In 1900, tuberculosis was the leading cause of death. In those parts of the country where statistics were complete and reliable, namely, the Original Registration States, the death rate was 195.2 per hundred thousand of population. In 1933, the rate had fallen in the same geographic area to 56.3 per hundred thousand and the disease was in fifth place as a cause of death. There had been a decline of 71.2 percent in the mortality in the thirty-three years which had elapsed. We estimate that in 1934 the death rate from tuberculosis in the Original Registration States had declined still further, to about 52. Among the industrial population insured in the Metropolitan Life Insurance Company, the decline has been even more marked. In the twenty-four years during which this Company has kept careful mortality figures, there has been a decline of 73.5 percent in the death rate from tuberculosis. It is an extraordinary fact that in 1934 the mortality from this disease, among white working class families, was actually down to 46.5 per hundred thousand. Twenty-five years ago, no one would have dared to predict that such a result could be achieved in so short a period of years.

It is of the greatest significance that the reduction in the tuberculosis death rate has continued uninterrupted throughout the period of the depression. In spite of the great hardships which have undoubtedly prevailed throughout the general population and particularly among the working class families living in cities such as are represented in the rank and file of Industrial policyholders, the death rate has continued to decline at about the same rate as prevailed during the years prior to the economic breakdown in 1929. Apparently, the forces which have been at work against this disease during these last five or six years have maintained their efficiency even to a greater degree than usual in order to counteract the unfavorable effects

of unemployment, of limited family incomes, of crowding and of all of the other factors incidental to economic disturbance in depression years. In some states, extraordinarily low mortality figures have been reached. Thus, in Iowa, a tuberculosis death rate of 24.9 per hundred thousand was attained in 1934. In 1933, at least six states had already reduced their rate to 30 or less. The indications are that in 1934 the situation was even better. There is every reason to expect that the prediction made in previous BULLETINS that the tuberculosis death rate for the whole country, in 1940, will be down to 40 per 100,000, or less, will be fully realized.

How shall we interpret this undoubtedly gratifying picture? Shall we assume that because the rates are low and are becoming continuously lower that the campaign has been won and that public health workers can afford to turn their attention from tuberculosis to other conditions, more pressing perhaps? The answer is decidedly "No". Tuberculosis is still a tremendously important public health problem because its damage is so decidedly concentrated in certain periods of life. It is still the chief cause of death in early adult life. It is still an important cause of orphanhood and of family disruption. In 1934, it was the leading cause of death among Metropolitan Industrial policyholders in a number of age periods. Thus, among white males, it ranked first between ages 15 and 45; among white females, it led at ages 15 to 35. Among colored males, it led at ages 10 to 45 and among colored females, at ages 5 to 35. This situation presents a serious challenge to those concerned with the health and welfare of the industrial population. Although the gains have been enormous, we are still far from having conquered tuberculosis.

The answer is very clear. The campaign has succeeded in achieving its primary objective; millions of lives have been saved from premature death many of whom are now at work; the campaign has demonstrated its effectiveness as not only a life saver but as an economic measure. Why then should not states and municipalities give consideration at this time to providing the additional facilities they need to take care of the final drive of the campaign? In some communities, additional beds are needed for the isolation and treatment of open cases. In others, additional clinic facilities are needed for better diagnosis of the disease. In all communities, more knowledge of the causes of tuberculosis and the better practice of personal hygiene are called for. Much benefit will undoubtedly accrue from the projected program for better housing of the people in cities. Past successes would amply justify a search for further victories rather than a relaxation of interest. A good general does not run away from victory. This is the time for tightening rather than relaxing the campaign.

Twins and Their Survival in the Population

About one percent of all confinements result in twin births. Thus even at birth twins are fairly rare. Grown-up pairs of twins are even more scarce because such a pair is subject, as it were, to a two-fold death rate, in the sense that it can be disrupted by the death of either one of the two twins. Just as it is possible to draw up a life table for single individuals showing how many, out of a cohort of 100,000 born, survive to each age of life, so it is also possible to draw up a kind of life table for pairs of twins showing how many of these pairs remain intact, both members living, to each age of life. Because there are two ways in which a pair of twins can be disrupted by death, as against only one way for the individual to die, the life table for pairs of twins regarded as one unit will necessarily show a very considerably more rapid decrease in the number of pairs surviving from age to age than the life table to which we are accustomed, relating to single individuals. Along the same line of thought, the average duration of joint life of a pair of twins is materially shorter than the average duration of life of the individual. It is interesting to compute some of the figures to illustrate the facts as they appear, for instance, for the conditions of mortality prevailing at the time of the last Census. This has been done on the basis of life tables for the population of the United States in 1929-1931, as published in the Statistical Bulletin of April, 1934. No allowance can be made for the probable excess of the death rate of twins, as compared with that of other persons. The results will therefore represent an upper limit of the possible survivals.

Considering first the mean duration of joint life of pairs of twins, the following figures, relating throughout to white persons, are found. A pair of male twins has a joint expectation of life at birth of 46.16 years, as compared with the expectation of life of 59.31 years of the single white male individual. A pair of white female twins has a joint expectation of life of 50.28 years as compared with the average length of life of 62.83 years for a single white female individual. Thus a pair of male twins has a joint expectation of life falling short of that for an individual male by 13.15 years, while a pair of female twins is only 12.55 years short in its expectation of life, as compared with the individual white female. The advantage in favor of females thus becomes more marked in the case of a pair of twins than it is in the case of an individual.

Naturally, the situation is intermediate in the case of a mixed pair of twins, one male and the other female. Here the joint expectation of life is 48.13 years.

The expectation of life at birth gives a sort of single representative average of the longevity of the cohort of twins. A much more complete picture is, of course, ob-

tained from a table showing the survivals of the original cohort of 100,000 to successive ages of life. An extract of such a table appears below showing the survivals, first, for the single individual, and second for pairs of twins considered as a unit, that is, when the death of either of a pair of the twins is regarded as terminating the joint life of the pair.

In this table we see, for example, how the figures in the third column, relating to joint survival of a pair of male twins, dwindle much more rapidly with advancing age than the corresponding figures in the second column, relating to an individual male. While 62 percent of all white males born live to age 60, according to the table here set forth, only 39 percent of pairs of male twins succeed in reaching this age undivided by death. Or, to go to the extreme end of the table, rather more than 2 percent of white males reach age 90, but only 6 in 10,000 pairs of male twins can expect that they will both attain this advanced age. A somewhat similar situation can be read out of the remaining columns of the table, which relate to female twins and to twins of mixed sex.

It has been remarked above that

Number of Survivors to Specified Quinquennial Ages Out of 100,000 Counted at Birth; Shown Separately for One Male Life, One Female Life, and Combinations of Two Lives (Twins)*

Age	Number Surviving to Specified Age Out of 100,000 Counted at Birth				
	One Male Life	Two Lives (Twins) Considered as a Unit			One Female Life
		Two Male Lives	One Male Life One Female Life	Two Female Lives	
0	100,000	100,000	100,000	100,000	100,000
5	91,869	84,399	85,771	87,165	93,362
10	90,973	82,761	84,267	85,801	92,629
15	90,239	81,431	83,079	84,761	92,066
20	89,099	79,386	81,191	83,038	91,125
25	87,605	76,746	78,632	80,565	89,758
30	85,944	73,864	75,798	77,784	88,195
35	84,049	70,642	72,675	74,767	86,468
40	81,685	66,724	68,998	71,348	84,468
45	78,580	61,748	64,429	67,227	81,992
50	74,528	55,544	58,724	62,087	78,795
55	69,208	47,897	51,578	55,541	74,526
60	62,170	38,651	42,675	47,119	68,643
65	53,148	28,247	32,224	36,760	60,630
70	42,091	17,717	21,076	25,073	50,073
75	29,637	8,784	10,997	13,767	37,104
80	17,339	3,006	4,004	5,333	23,094
85	7,713	595	855	1,229	11,087
90	2,371	56	89	141	3,756

*Based on life tables computed from mortality statistics for white persons in the United States, excluding Texas and South Dakota, 1929–1931. See Statistical Bulletin, April 1934, page 9.

grown-up twins are necessarily rarer than twin births. Our table enables us to give this statement a quantitative twist and, furthermore, to make at least a rough estimate of the number of twin pairs, in the population, that are fortunate enough to be jointly surviving at different ages of life and at all ages combined. Such an estimate must be regarded only as a rough approximation if we base it on the accompanying table, since this makes no allowance for the heavier mortality in past years, nor for the probable excess mortality of twins. Even so, the figure thus arrived at is not without interest. We find in this way that at the time of the last Census, in 1930, there would have been living something of the order of 600,000 male twin pairs, 625,000 female twin pairs and 635,000 pairs of twins of mixed sex. This gives a total of rather less than 4,000,000 twins of all kinds in the white population of the United States, or about 3.7 percent of the population. The relative preponderance of twins of mixed sex is due to the fact that at the time of birth twins of this type predominate, a circumstance to which we shall have occasion to refer again in a later article.

Automobile Fatalities Decline Among Children; Increase Among Adults

THE death rates for the various types of automobile accidents, and the trends observed for ten years, differ markedly according to the kind of accident and the age and sex of those fatally injured.

In childhood (ages 1 to 14 years), the 1934 automobile accident death rate among boys insured in the Industrial Department of the Metropolitan Life Insurance Company was 19.4 per 100,000, or over two and one half times the death rate for girls (7.5 per 100,000). Approximately three fourths of the deaths in each sex resulted from automobiles striking pedestrians. The greater venturesomeness of boys than of girls is clearly indicated by this marked difference in the death rates, and is again reflected in the higher figure for boys from deaths caused by automobiles colliding with bicycles, sleds, etc.

The automobile accident death rate in childhood, however, is declining, and this is one bright spot in the dismal picture of our steadily growing motor vehicle accident mortality rate. In this we see the value of safety education and applied safety work, of public playgrounds and of other methods employed to safeguard children against the street hazards to which they are exposed. The actual figures show, for these automobile-pedestrian deaths, a decline of 21.5 percent, since 1925, among boys, and of 33.3 percent among girls. Deaths of children in collisions between automobiles were much more numerous in 1934 than in 1925, among both boys and girls; but this rise reflects merely the in-

creasing ownership and use of cars for family transportation.

The death rate for automobile accidents for males between 15 and 74 years (46.0 per 100,000), in 1934, was more than three and one half times the rate for females (13.0). Automobiles striking pedestrians caused a larger number of deaths among both men and women than did any other type of automobile accident. In fact, over 40 percent of the deaths in each sex were due to casualties of this kind. The death rate for male policyholders was 20.4 per 100,000, or almost four times the rate for females (5.5). Next in importance among both men and women were collisions between vehicles; this accounted for about 30 percent of the deaths in each sex. Here the 1934 death rate for males was 12.3 per 100,000, or more than three times the female rate of 3.9. Collisions between automobiles alone accounted for 72 percent of the deaths of men and for 85 percent of those of women which resulted from vehicular collisions. Accidents due to automobiles striking fixed objects were four times as frequent among men as among women, and non-collision accidents were three and one half times as frequent.

A comparison of the figures for the first and last years of the decade under review, 1925 to 1934, shows that increases have occurred in late youth and in adult life, in all major types of automobile accidents. In vehicular collisions, the death rate among women has gone up 144 percent while that for men has advanced 112 percent. A greater percent increase in the number of women drivers and riders may account for the larger rise in the death rate for that sex. Similarly, and possibly for the same reason, the rate for deaths from collisions between automobiles and fixed objects has risen 333 percent among women, as compared with 189 among men.

The trend of the death rate, by sex, of pedestrians killed in motor vehicle traffic presents an interesting sidelight on the general picture of automobile fatalities. The actual figures show a rise, in ten years, of 102 percent in the mortality rate among male pedestrians, as compared with an increase of only 31 percent for women. Do they indicate that carelessness and venturesomeness among men pedestrians have increased much more than among women? There are, of course, many factors at work and no simple answer can be given, as full statistical data are not available.

Health Record for February, 1935

HEALTH conditions among the millions of Industrial policyholders of the Metropolitan Life Insurance Company have been excellent during the winter of 1935. Their cumulative death rate, at the end of February, was 9.5 per 1,000, which is identical with the rate for the similar part of last year, and lower than that recorded in 1933.

Among the policyholders who live in Canada, however, and in that part of the United States lying west of the Rocky Mountains, this year's mortality rate, while still low, shows a slight rise over that for the corresponding months of last year.

There are a number of very favorable items in the early 1935 health record. First of all, the mortality from tuberculosis is continuing to decline, with an actual drop of 3.3 percent as compared with the cumulative death rate for January and February of last year. Other major causes of death to show improvement are cancer, the principal degenerative diseases, suicides, accidents and automobile fatalities. Had it not been for the sizable rises this year in the mortality from influenza and pneumonia, a very considerable drop from last year's death rate for all causes combined would now be in evidence.

The death rate for the month of February in the general population of the large cities of the United States was 12.8 per 1,000 estimated population as compared with 13.3 in January 1935, and 12.9 in February 1934. The reportable diseases which showed increased incidence during February, as compared with January, were measles, scarlet fever and smallpox; those which declined in prevalence were diphtheria, influenza, poliomyelitis and typhoid fever. There was more sickness as compared with February 1934, from influenza, measles, poliomyelitis, scarlet fever and smallpox; there were fewer recorded cases of diphtheria and typhoid fever.

Special public health activities recently reported include the following: According to press reports, plans are being made to revise the medical service in the New York City schools with a greater concentration on the younger pupils for an early check of defects. Plans have been perfected by 15 physicians representing medical associations for making pneumonia serum available to all physicians in New York State. The Neurologic Institute of COLUMBIA-PRESBYTERIAN MEDICAL CENTER, in New York City, has recently organized a division of child neurology endowed by the FRIEDSAM FOUNDATION. The PENNSYLVANIA LEAGUE FOR SOCIALIZED MEDICINE has been organized in Philadelphia with a first membership of about 100 physicians of that city. The CROCKER INSTITUTE OF CANCER RESEARCH and the PRESBYTERIAN HOSPITAL, both of New York City, have jointly installed an entirely new type of X-ray apparatus whereby it is possible to treat several patients at the same time. The NEW YORK DIABETES ASSOCIATION, which is affiliated with the NEW YORK TUBERCULOSIS AND HEALTH ASSOCIATION, will serve as a clearing house for the study of diabetes as a health problem, devise measures for its control, assist in the building up of clinics dealing with diabetes, carry on health education in matters relating to the disease, obtain insulin for indigent sufferers and endeavor to provide nursing and hospital care.

The following table shows the mortality among Industrial policyholders for February 1935; January 1935, and February 1934, together with the cumulative rates for the first two months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Death Rates per 100,000 for Principal Causes. Weekly Premium-Paying Business in Industrial Department. All Ages (Annual Basis).*

MONTHS OF FEBRUARY 1935; JANUARY 1935, AND FEBRUARY 1934.

CAUSES OF DEATH	ANNUAL RATE PER 100,000 LIVES EXPOSED*				
	February 1935	January 1935	February 1934	Cumulative January-February 1935	Cumulative January-February 1934
TOTAL—ALL CAUSES	938.8	966.5	944.3	953.8	952.8
Typhoid fever	.3	.2	1.1	.3	1.0
Measles	2.5	1.4	3.3	1.9	2.4
Scarlet fever	3.8	3.1	3.3	3.4	3.3
Whooping cough	3.5	3.4	3.5	3.4	3.4
Diphtheria	2.7	3.1	2.5	2.9	2.7
Influenza	32.4	33.6	19.6	33.0	18.9
Tuberculosis (all forms)	55.6	62.0	60.1	59.1	61.1
Tuberculosis of respiratory system	51.1	57.3	53.5	54.4	54.4
Syphilis, locomotor ataxia and general paralysis of the insane	11.2	12.0	12.1	11.6	12.5
Cancer (all forms)	93.4	94.7	98.5	94.1	96.3
Diabetes mellitus	28.3	29.5	25.1	29.0	26.5
Cerebral hemorrhage; apoplexy	71.3	67.2	72.3	69.1	72.4
Diseases of heart†	186.5	184.2	188.3	185.2	192.2
Diseases of the coronary arteries and angina pectoris	35.7	35.1	32.8	35.4	32.5
Pneumonia (all forms)	96.3	116.0	101.7	107.0	99.3
Diarrhea and enteritis	4.2	6.1	6.2	5.2	6.5
Appendicitis	10.7	10.6	11.9	10.6	12.2
Chronic nephritis (Bright's disease)	69.1	67.8	71.5	68.4	71.7
Puerperal state—Total	9.6	10.7	9.4	10.2	9.0
Suicides	8.1	7.8	7.6	8.0	9.3
Homicides	5.3	7.0	5.1	6.3	5.3
Accidents—Total	52.0	56.3	53.4	54.3	55.9
Automobile accidents	16.4	21.6	20.2	19.2	21.8
All other diseases and conditions	156.0	154.6	155.0	155.2	158.4

*The rates for 1934 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

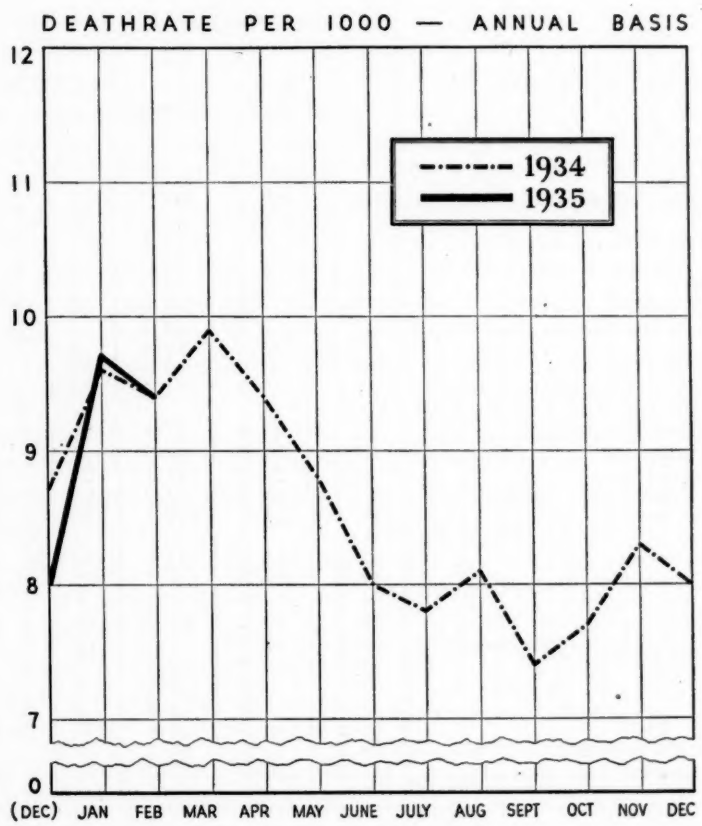
†Excludes pericarditis, acute endocarditis and acute myocarditis.

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

STATISTICAL BULLETIN,
Metropolitan Life Insurance Company,
1 Madison Avenue, New York City

DEATHRATES FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE CO. – INDUSTRIAL DEPT.
WEEKLY PREMIUM PAYING BUSINESS — TOTAL PERSONS



1934	9.6	9.4	9.9	9.4	8.8	8.0	7.8	8.1	7.4	7.7	8.3	8.0
1935*	9.7	9.4										

* *Rates for 1935 are provisional*

METROPOLITAN LIFE INSURANCE COMPANY PRESS
NEW YORK, U.S.A.
78393